A cache consistency protocol for multiprocessors with multistage networks

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ABSTRACT

A hardware based cache consistency protocol for multiprocessors with multistage networks is proposed. Consistency traffic is restricted to the set of caches which have a copy of a shared block. State information is distributed to the caches and the memory modules need not be consulted for consistency actions. The protocol provides two operating modes: distributed write and global read. Distribution of writes calls for efficient multicast methods. Communication cost for multicasting is analyzed and a novel scheme is proposed. Finally, communication cost for the protocol is compared to other protocols. The two-mode approach limits the upperbound for the communication cost to a value considerably lower than that for other protocols.

REFERENCES

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1 Research session: views and cache management: Caching with "good enough" currency, consistency, and completeness

Hongfei Guo, Per-Åke Larson, Raghu Ramakrishnan

August 2005 **Proceedings of the 31st international conference on Very large data bases VLDB '05**

Publisher: VLDB Endowment

Full text available: pdf(317.31 KB) Additional Information: full citation, abstract, references, index terms

SQL extensions that allow queries to explicitly specify data quality requirements in terms of currency and consistency were proposed in an earlier paper. This paper develops a data quality-aware, finer grained cache model and studies cache design in terms of four fundamental properties: *cache, consistency, completeness* and *currency.* The model provides an abstract view of the cache to the query processing layer, and opens the door for adaptive cache management. We describe an imp ...

2 An Asynchronous Avoidance-Based Cache Consistency Algorithm for Client Caching DBMSs

M. Tamer Özsu, Kaladhar Voruganti, Ronald C. Unrau

August 1998 **Proceedings of the 24rd International Conference on Very Large Data Bases VLDB '9**

Publisher: Morgan Kaufmann Publishers Inc.

Additional Information: full citation, citings

3 Cache: An active data-aware cache consistency protocol for highly-scalable data-shipping DBMS architectures

Keqiang Wu, Peng-fei Chuang, David J. Lilja

April 2004 **Proceedings of the 1st conference on Computing frontiers**

Publisher: ACM Press

Full text available: pdf(428.25 KB) Additional Information: full citation, abstract, references, index terms

In a data-shipping database system, data items are retrieved from the server machines, cached and processed at the client machines, and then shipped back to the server. Current cache consistency approaches typically rely on a centralized server or servers to enforce the necessary concurrency control actions. This centralized server imposes a limitation on the scalability and performance of these systems. This paper presents a new consistency protocol, Active Data-aware Cache Consistency (ADCC), ...